



Key Elements for a Successful NIH R Grant Application

Jill A. Rafael-Fortney, Ph.D.

Dept. Physiology & Cell Biology, Biological Chemistry
& Pharmacology, and Cardiovascular Medicine



NIH 101: Basics

- NIH: 27 Institutes and Centers (ICs); Program Directors are your interface point (filter & facilitate)
- Most NIH grants are investigator-initiated (80% of budget; don't get hung up on finding 'special initiatives')
- Grant review at each of 2 levels (Study Section & Council) is by peers, with decisions based on outcome of peer review
- IC "pay lines" vary, based on strategy & funds available (see NIAMS, NHLBI, NINDS websites "funding strategies") Typically ~10-15% in recent years.
- ESI/NI advantages

Some information modified from John Porter, Ph.D., NINDS PO for 10 yrs.



Know the instructions

- Read the instructions
- Watch videos on the NIH OER website
- Sign up and read Extramural Nexus and Peer Review Notes to find out news and changes



January 2017



Open Mike

FY2016 By The Numbers

Posted on February 3, 2017 by Mike Lauer

Over the past few days, we released our annual web reports, success rates and NIH Data Book with updated numbers for fiscal year 2016. Overall, we see steady increases. In addition to looking back over the numbers we typically highlight in this post, we want to point out several new research project grant (RPG)-specific activity codes used to support extramural research. FY 2016 saw the launch of some new [Continue reading →](#)

Research Commitment Index: A New Tool for Describing Grant Support

Posted on January 26, 2017 by Mike Lauer

On this blog we previously discussed ways to measure the value returned from research funding. The “PQRST” approach (for Productivity, Quality, Reproducibility, Sharing, and Translation) starts with productivity, which the authors define as using measures such as the proportion of published scientific work resulting from a research project, and highly cited works within a research field. But these factors cannot be considered in isolation. Productivity, most broadly defined, is the measure of output considered in relation to several measures of inputs. What other inputs might we consider? Several of my colleagues and I, led by NIGMS director Jon Lorsch – chair of an NIH Working Group on Policies for Efficient and Stable Funding – conceived of a “Research Commitment Index,” or “RCI.” We focus on the grant activity code (R01, R21, P01, etc) and ask ourselves about the kind of personal commitment it entails for the investigator(s). We start with the most common type of award, the R01, and assign it an RCI value of 7 points. And then, consultation with our NIH colleagues, we assigned RCI values to other activity codes: fewer points for R03 and R21 grants, more points

Latest CSR/NIH Peer Review News



CSR-NIH-News <csrni.news@MAIL.NIH.GOV> sent by [1 more](#)

Wednesday, February 1, 2017 at 3:52 PM

To: CSR-PEERREVIEWNOTES@LIST.NIH.GOV

Check Out and Comment on the Latest Issue of the CSR/NIH Peer Review Notes

[View Here!](#)

- **New Video for NIH Basic Research Applicants and Reviewers**
- **Congressional Support for NIH Top 5 Things SROs Wish Reviewers Would Do**
- **8 Ways to Successfully Navigate NIH Peer Review Videos**
- **Simplification of the Vertebrate Animals Section**
- **SRO Helps Advance Peer Review in Indonesia**

To subscribe or unsubscribe, visit our [Listserve Web site](#).



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

Impact Score – 5 criterion scores

- Significance ***
- Investigator – must show basal productivity, find collaborators when needed for research direction; do not stick only to your wheel-house if it's not the best scientific direction
- Innovation – can't be incremental
- Approach ***
- Environment – need to be able to do the research



Impact Score – 5 criterion scores

- NOT an average! Some reviewers use the worst criterion score as the impact score with the rationale that the weakest link limits impact. Some reviewers give an impact score that is better than the worst score with the rationale that the combination of criteria affect impact



New scoring criteria

Cover in Research Strategy:

- Scientific premise
- Rigor & Reproducibility
- Sex as a biological variable

Separate form page:

- Authentication of Key Resources (Biological and Chemical)



Scientific Premise (Contributes to significance)

- “The strengths and weaknesses of the data and previously performed work upon which the proposal is built upon.”
- “consideration of the strengths and weaknesses of published research or preliminary data to evaluate the rationale for the proposed approach. Without this information, the scientific premise of the proposed experiment may be built on shaky grounds.”
- **Include as bolded/underlined statement in Specific Aims page**



Rigor and Reproducibility

- History and Rationale:
 - Failed clinical trials

Landis et al., *Nature* 490:
187-91, 2012

PERSPECTIVE

doi:10.1038/nature11556

- How to address:
 - Blinding
 - Randomization
 - Sample-size estimation
 - data handling: transparency and analyses
- Include as a separate paragraph at the beginning of Approach or throughout

□ A call for transparent reporting to optimize the predictive value of preclinical research

Story C. Landis¹, Susan G. Amara², Khusru Asadullah³, Chris P. Austin⁴, Robi Blumenstein⁵, Eileen W. Bradley⁶, Ronald G. Crystal⁷, Robert B. Darnell⁸, Robert J. Ferrante⁹, Howard Filli¹⁰, Robert Finkelstein¹, Marc Fisher¹¹, Howard E. Gendelman¹², Robert Golub¹³, John L. Goudreau¹⁴, Robert A. Gross¹⁵, Amelie K. Gubitzi¹, Sharon E. Hesterlee¹⁶, David W. Howells¹⁷, John Huguenard¹⁸, Katrina Kelner¹⁹, Walter Koroshetz¹, Dimitri Krainc²⁰, Stanley E. Lazic²¹, Michael S. Levine²², Malcolm Macleod²³, John M. McCall²⁴, Richard T. Moxley III²⁵, Kalyani Narasimhan²⁶, Linda J. Noble²⁷, Steve Perrin²⁸, John D. Porter¹, Oswald Steward²⁹, Ellis Unger³⁰, Ursula Utz¹ & Shai D. Silberberg¹



Approach

- Well designed, controlled, rigorous, appropriate experiments
- Publications or preliminary data demonstrating expertise with techniques
- Well articulated expected outcomes: how you will interpret data and strong alternatives
- *If the reviewers think your premise is important and you have been productive, it is the approach that will be your biggest challenge.



What makes an “Outstanding” application?

- A significant and important scientific question
- A strong and well supported premise
- A balance between overly focused (incremental) and overly ambitious
- Know the literature and DO NOT IGNORE contradictory data – someone on the review panel will know!
- A rigorous and comprehensive approach – best controls, well powered, blinded, etc



Common New Investigator Weaknesses

- Overambitious
- Poorly written Specific Aims Pages
 - Aims page must convince reviewers it's a good grant
 - State the Scientific Premise
 - Build a case for your scientific premise – think like a lawyer
 - Be specific and accurate
 - Explain the gaps in knowledge and how you will fill them
 - Explain what exactly you will do – do not be vague



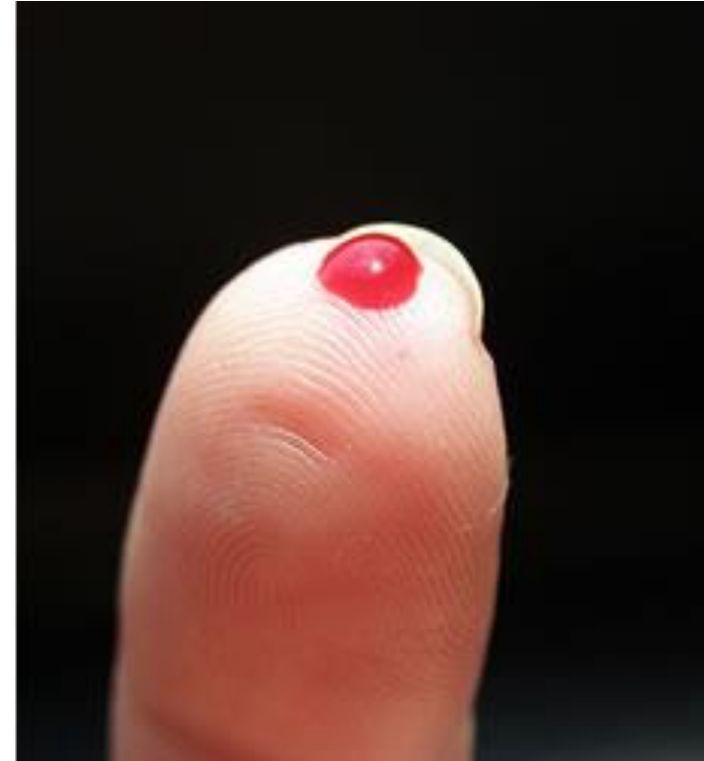
Other things to remember

- **Read the Literature:** So many reviews of New Investigator grants are tanked by not knowing relevant background
- **Form the strongest team:**
 - Don't be afraid to collaborate
 - Science has changed and you no longer need to demonstrate success completely independently. So don't listen to older mentors who may tell you differently based on their own experience.



Study Section: Fatal Hemorrhage Starts with a Pin Prick

- Cover all bases in feasibility, preliminary data, & expertise
- Ask for help from mentors, colleagues, & Program Director
- Bleeding can start slowly (e.g., over a detail in a data figure). Even your strongest proponents on Study Section sometimes can't stop fatal hemorrhage once started



So you've done all of the "right" things, and avoided the pitfalls, but your grant was "*Not Discussed*"

- Don't take it personally
- Don't spend time guessing about what the summary sheets will say
- Read the summary sheets and let them sink in for at least a few days
- If the problems are fixable, fix them and try, try again.
- If the problems require more data, get to it.
- If 2-3 reviewers see the same problems and they are not fixable, recalibrate and try something else



Summary Sheets

- Reviewers will probably have suggestions on what to improve.
- Maintain good attitude: Peer review makes science better! 😊
- Often 2 or 3 reviewers have the same suggestions
- Take all reviewer comments seriously – you may get the same reviewer again ;)
- Pay particular attention to discussion summary
- With ~10% paylines, very few applications get funded on initial submission, don't get depressed.



So, how do you get a grant???

- Everything we discussed PLUS
- LUCK
 - What else is in the pile
 - What reviewers you get
 - Use Reporter to choose study sections and help write appropriate grants for that panel
- If you think you have a great idea, and other people who do not live in your head think you have a great idea, then don't give up! Be persistent!

